Menlo Park Notebook #206 [N-81-03-09]

This notebook covers the periods March-April 1881, August 1882, and January 1883. All of the entries are by Edison. Some of the entries were witnessed by John Ott. Most of the material relates to electric lighting. Included are notes and drawings of automatic voltage regulators, electric meters, dynamos, conductors, distribution systems, and chemically treated filaments. Included also are notes from various works on chemistry and drawings of telephone devices. The book contains 276 numbered pages. The last few pages have been torn out of the book.

Blank pages not filmed: 22-23, 36-39, 148-149, 152-155, 166-167, 172-173, 176-177, 182-183, 188-192, 197-203, 230-247, 250-275.

Missing page numbers: 157-158, 163-164, 185-186, 193-196, 207-208, 211-216.

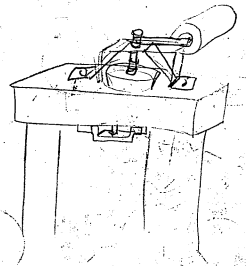
LIBRARY OF THE

BOARD OF PATENT CONTROL,

120 BROADWAY, NEW YORK.

From Library
44 Broad St. N.Y.
May 1, 1896

March 1881
Jag

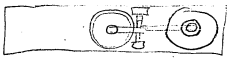


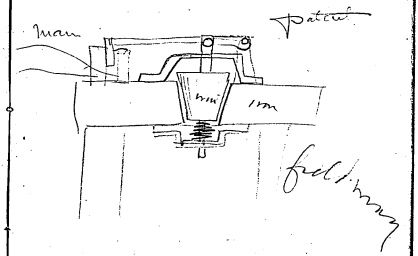
March 9 1881

Tate

g T.O

Auto Reg



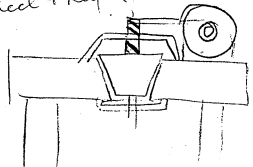


March 9 1881

Auto Reg

Patent p. F. 0

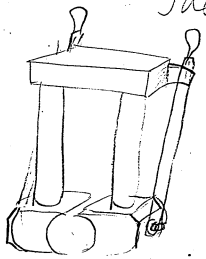
Can have a hand wheel & Reg by hand



use this for prime fieldwork to work other fields also for sale

March 9 1881

JAE

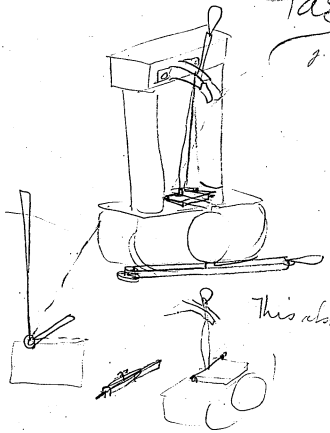


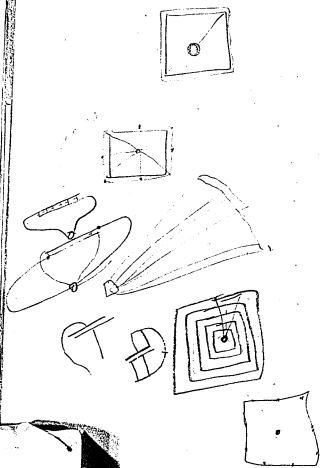
Regulator

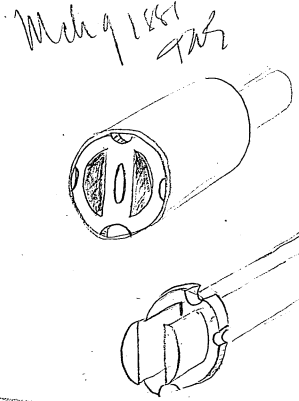
March 9 1881

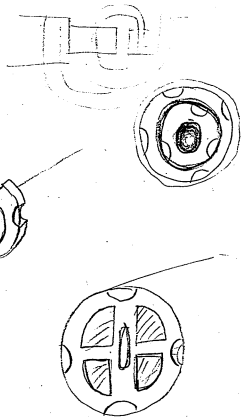
Tag

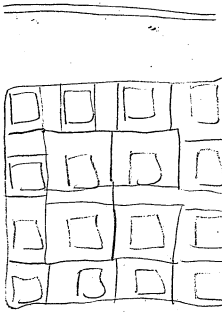
g.s.o

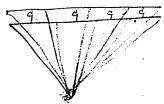




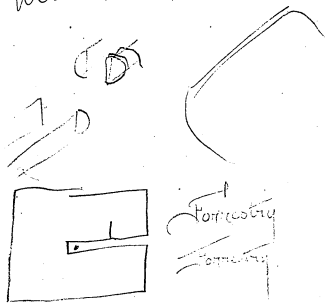




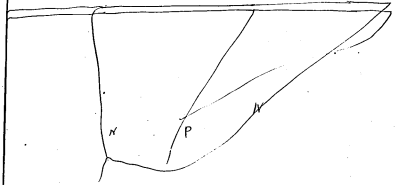


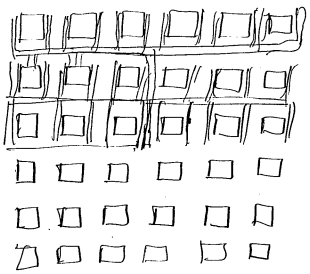


Mech 9 1887



Mohr 1881 Taf





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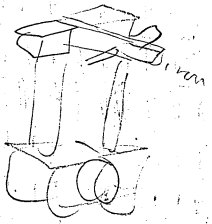
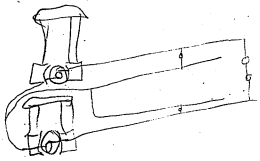


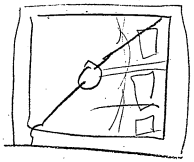
Mech 10-1-57

- pg



[ITEM FOUND IN BOOK]

3-wire system 3/10/21 (?)



March 1861

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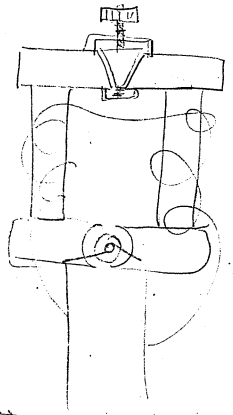

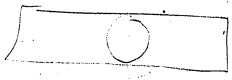

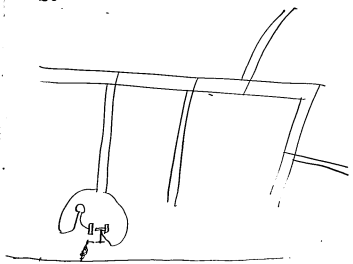

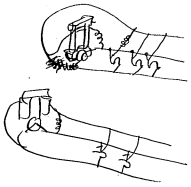

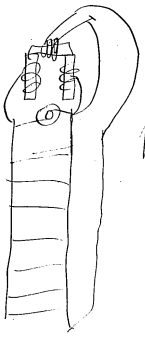

March 14. 1881

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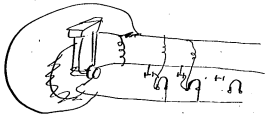
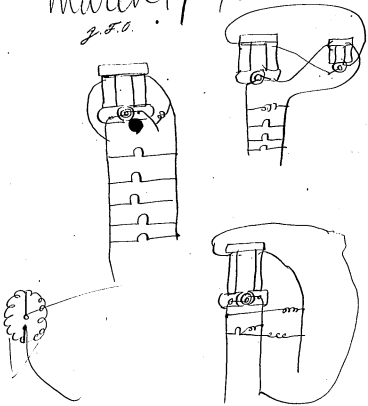
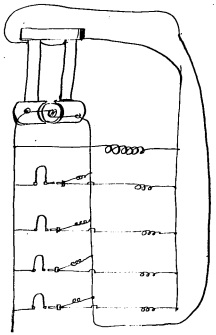


March 14 1881 Tal 29

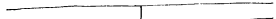
J.F.O.





March 14 1881 Matt
for patent

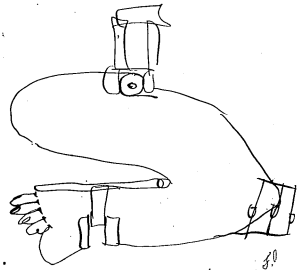
750 Head,
396 Lamb.



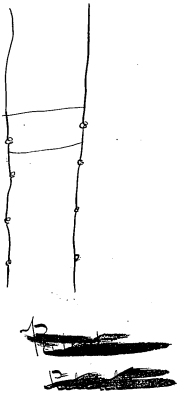
193

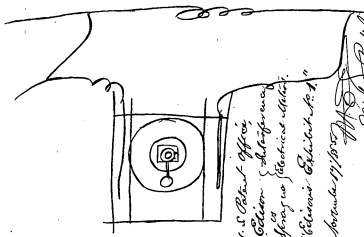
193

167 lbs,



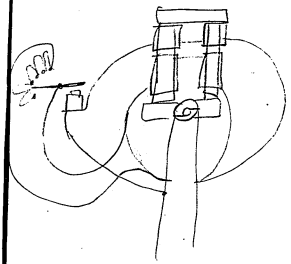
April 3 1881 TUE 9:30
Surface for prosthesis





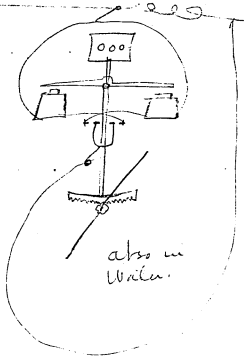
Copper cylinder revolving on a Sulphate Copper Solution with a weighted Counter within it so that when cylinder revolves Counter will show detail deposit of Cu on one side & Steel off other

April 3 1881 TAE
J.F.O



Auto Regulation
April 3 POSITIVE

J. F.O



April 3 1881

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April 3 1881
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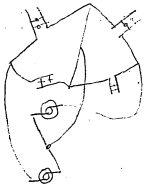
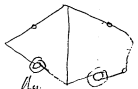
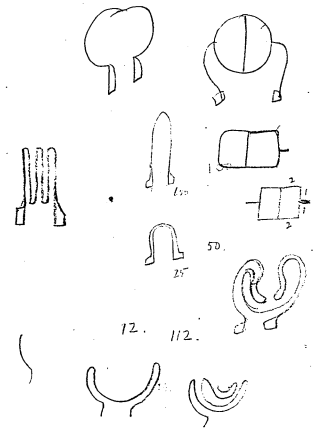




Wait for

April 5 1881
JAR

Main Cut-off-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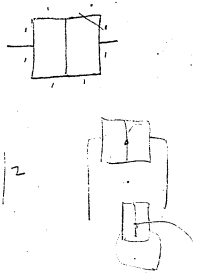
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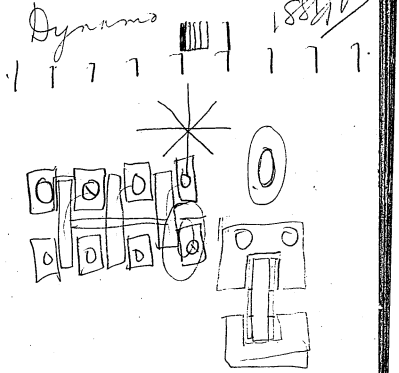
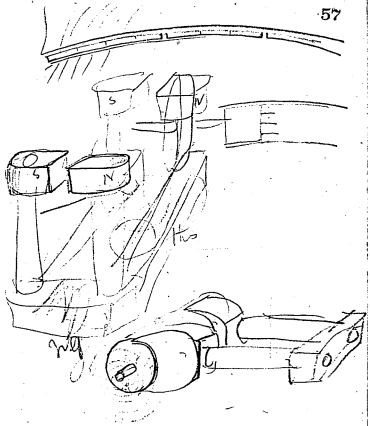
April 14

Dynamo 1881

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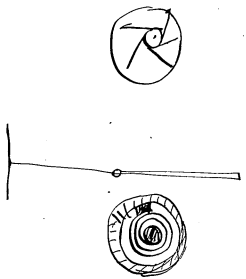

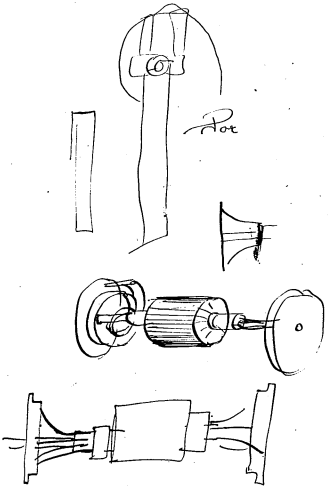

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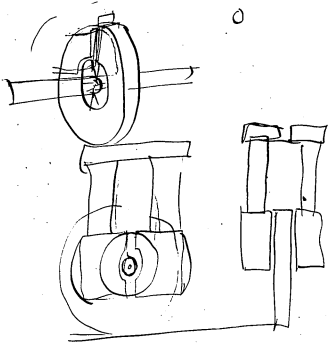
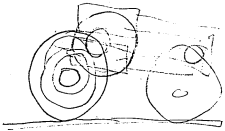
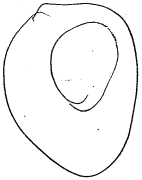






Aug 1 1882
Tas

Lamp Experiments -

Use Cocoanut charcoal platinized by soaking 5 minutes in boiling solution Bichloride platinum then igniting in plat crucible or holding in flame spirit lamp, put it in lamp hot + pump out quickly

Zinc Ethyl and Sodium Ethyl instantly absorbs CO. turns black = Wanklyn says deposit not Carbon as it dissolves in HCl. See Jul Chem Soc p 13 Vol IV. 1879 -

Karsten. (see Ure's Mills 107-)

Say charcoal made from wet wood has but 14 parts of the Carbon while dry wood gave from 33 pts 25 pts Carbon but 100 parts wet only yielded 14 pts.

Charcoal charred by superheated Steam 536 Fahr. analyzed

Carbon	71.42
Hydrogen	4.83
Oxygen & Nitrogen	22.91
ash	0.82

Schombein found that ferric salts reduced & coaled by agitating their solution with charcoal powder & Mercuric salts are reduced to Mercurous salts

Berthelot has proved that by intensely igniting charcoal by the voltaic arc in a current of pure Hydrogen that Acetylene C_2H_2 is formed

Try lighting a lamp in pure dry Carbonic acid to see how long it stands also exhaust d. in which Carbonic acid is the residual gas = ditto by these ~~Two~~ Experiments with pure dry Carbonic Oxide CO.

The residual gas of our lamps is Carbonic acid from the lungs of the glass blowers

Carbonic anhydride is not decomposed by heating with Sulphur or Chlorine + the Halogens dtto. but if mixed with hydrogen + submitted to a high temp water + CO produced =

Carbonic acid decomp by Sparks or the silent discharge Making ~~CO2~~ CO + O.

A Solution of Cuprous Chl in HCl or a Cuprous Salt in Ammonia gradually absorbs CO as a gelatin with it but if liquid Salt most CO Comes off

According to Battinger
Deut. Chem. Ges. Ber 1877 X 1122
CO readily absorbed large quantity by well cooled dry Hydrocyanic acid,
CO unites with Potassium if latter heated to 176 Febr
this is frequently employed in gas analyses.
CO unites with equal vol Chlorine in Sunlight forming Carbonic Oxydichloride, Phosgene gas

CO Enters directly combn with 75
Potassic hydrate when heated
with it form. formate.

Chloride Silver in powder exposed Current
dry ammoniacal gas rapidly
absorbed - the Chloride increases
⅓ in Weight. does this at ordinary
Temperature - by heating can be
driven out + Condensed by ice
in another part of tube

Electric Spark decomposes
ammonia 1 in 2 nitrogen 6 Hydrogen

Chlorine dec Ammonia at Ordinary
temp liberating N + forming
Cotton Cremastine Chloride Nitrogen

Nitrogen Combines with finely divided Boron at red heat
also 1 pt anhydrous Borax + 2 pts Chl ammonia at red heat
gives Nitride Boron, which is white powder feels like talc + not attacked by heating in either H or Cl.

I think pentachloride phosphorus is even better than phos anhydride as when heated to ~~200~~ high temperature decomp to phos anhy + free Chlorine
See Miller 295 - inorganic

Moulded up battons ☐
from our little mould
of following some hard &
some moderately hard

Phosphate Lime
Magnesia.
Alumina.
Silica
~~Hydrate~~ ferric oxide
~~H~~ gypsum

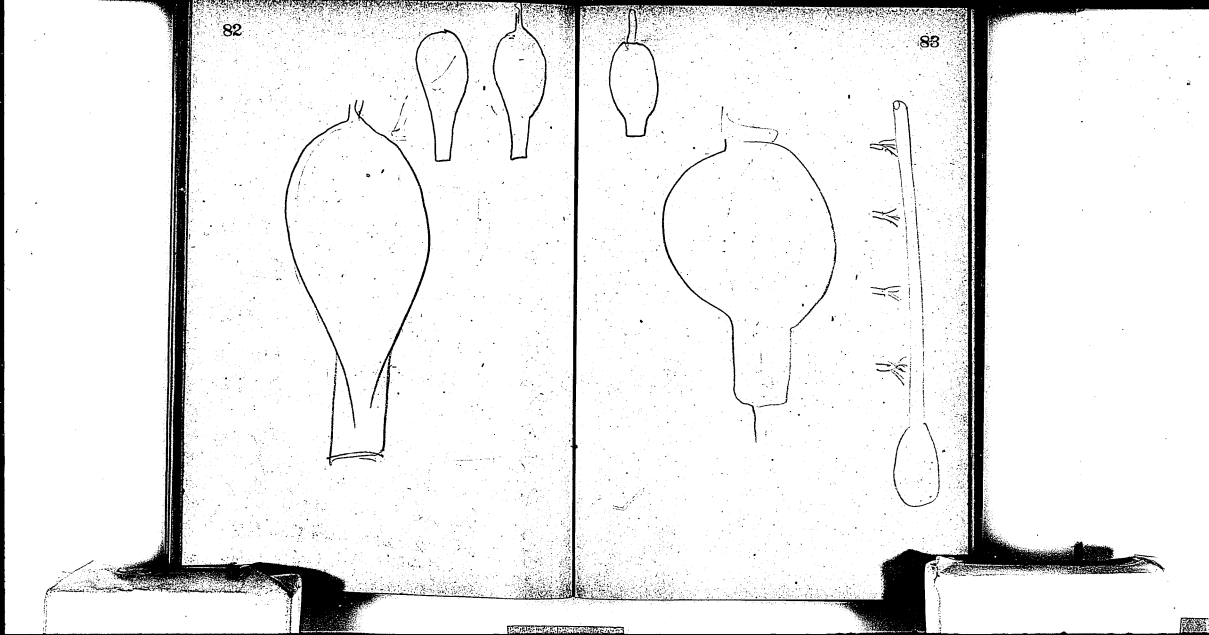
a piece of freshly burned charcoal
Exposed to an Oxidising flame
rapidly to in 3 days' maximum weight
$\frac{4}{5}$

Spongy palladium absorbs 686
Volumes of Hydrogen but
Exhibited no tendency to absorb
nitrogen or Oxygen

Gypsum

Graham - see Muller physics
p 120 - states that Soft
rubber lets in O & scarcely
any N. hence on pumping
residual after which is
Entirely O. a square
meter of surface of
rubber at spherical ref.
at 20c 2.25 - Cub Centims
per min. of which 42 pc was O.

Continued to p. 91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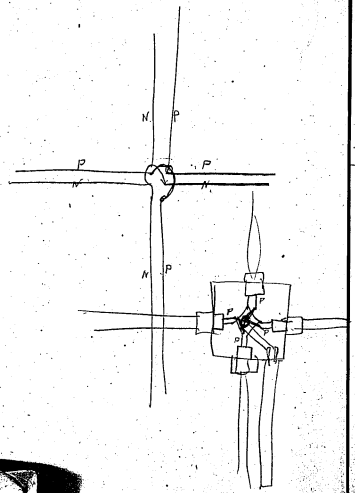
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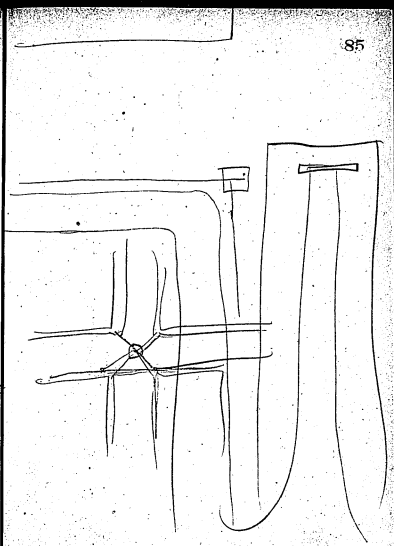

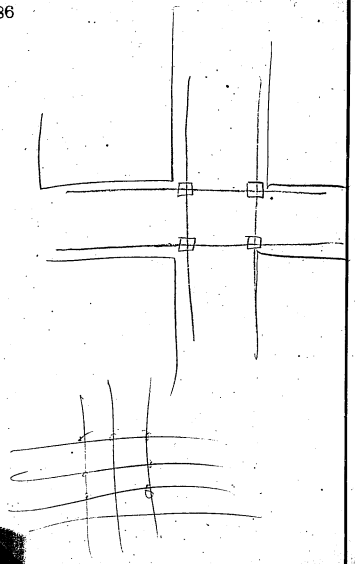

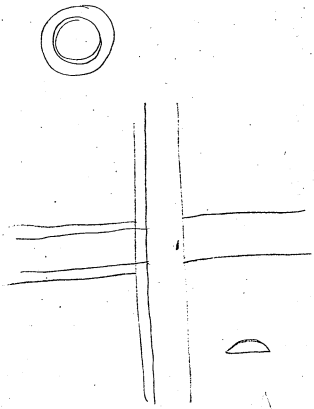

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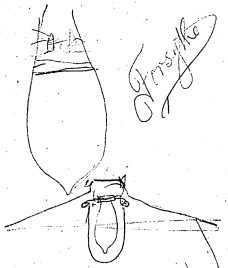


2001
1001

Caoutchouc like Charcoal has power absorbing rapidly Ammonia, Nitrous oxide, Sulphurous anhyd.
See Grahams Expruments in his Chemistry + Phil Trans. 1866, p 399. also 1863 p 385

The gases are frequently rendered in bulk as much as would be needed for Respiration —

absorbtion by Caoutchouc Equal parts was CO_2 1 H 2·4 — O 5·3 air 11·8 CO 12 — N 13·5 — for passed through the membrane at 4 o'clock only

1/11 the velocity with which it passed through at 60°

Might try working sealing in plat wire by our process for freeing air as P take 1.4 vols of H retain it up to a red —

Copp takes up .3 to .6 its bulk of H.

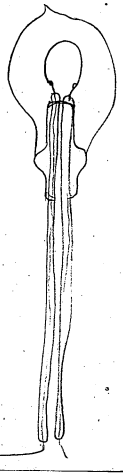
For Secondary Battery Hg red oxide of Hg Lets go its O by slight heat —

In form of sponge Platinum absorbs 1.48 its bulk while palladium sponge absorbs 90 vols by dimension

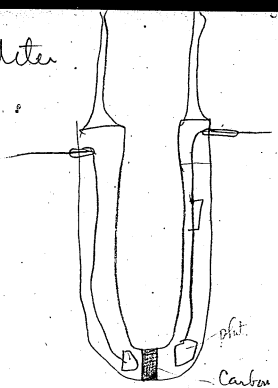
The blackening of one of the platinum wire (+) positive wire passing through the glass is due to the fact that there is a constant spark here which decomposes CO to C + free O. It is probable that this spark also decomposes some CO_2 + Vac + deposits on glass.

The Hydrates of Sodium, Potassium + phosphorus anhydride retain their water at any temperature hence in our Experiments use anhydrous K + Na CO_3 burning the metal as well as the dried Hydrates

Make an extraordinarily long seal to get rid of that spark on p plat wire that dumps the CO.



Meter



Electrical dynamo transformer by
dep of EMF.

Bunsen says syrupy phosphoric acid dont absorb gases

For preparing absorbent balls
See p 53 Bunsens Gasometry

Fused Chloride Calcium absorbs ammonia gas
Fused KO, absorbs CO_2

Bunsen used balls of phosphorus
Cost# under vacuum vessels

absorption only occurs above 15- or 20 C of diethyl methyl ethyl C or Similar Hydrocarbon so present phos must be heated nearly up to melting point before it absorbs O

of at Commencement Expt
Phos ball whitens when its
Hc if no cloud then no O
Phosphorous acid is formed

Tension Vapor phos-ous acid
which Coats walls. Cause depth
of Hgs not carefully dried (with
ball potash Bunsen) thumb phos-ic
anhydride best

Bunsen rather recommends Liebigs
plan of absorbg with Ball of
paper pulp moistened at
100 C + saturated with a
Concentrated Solution of
pyrogallate of K slosh it
absorbs slowly but
Completely, particularly if Ball
renewed, but then not Examined

with the small amount O ' residual, everything must be well dried. The pyrogal of K is a thick syrupy solution,

to absorb CO_2 the pot ash ball must contain so much H_2O that its salt melts to receive impression from the nail & must be moistened externally with H_2O before using

Sulphuretted H. absorbed by Coke Ball Coated with Ball Sul Cu Lactate Aq - Tartar Emetic with Lact decomposable by Sulphuretted H. Sul Cu in form ball & chromate Hg

absorb H slowly

Dry Binoxide Manganeese
or peroxide lead decomp
Sul H quickly & immediately
but Bunsen says they are bad
in gas analyses as they absorb
large quantities gas being porous
bodies, Hals ok for us

Phosphoric acid balls made
by dipping platinum in
red hot covering coil of
phosp ic acid

~~Binoxide manganese~~

Ball pure caoutchouc moistened
also absorbs Sulphuted H as
well as CO_2 Immediately

HCl gas absorbed by ball
oxide Bismuth, oxide Zinc
which formed while moist & then
ignited in flame.

Sul Magnesia or Gorey & especially
Sul Soda answer Extremely
well balls formed by dipping
wire in melted Salt
— then over N_2O of Crystalize
Specially good when made
Quantity HCl gas present
Everything dried with phos
anhydride

Burning
Carbonic Oxide CO can be
seperated from Light Carburetted
H - Hydrogen, Nitrogen,
Carbonic acid &c by means of
a concentrated Solution Subchloride
of Copper by saturating ball of
paper pulp

Olefiant gas (Elayl) absorbed
Coke Ball soaked Concentrated
(but still liquid) Solution of
anhydrous Sul acid in
monohydrated Sul acid The
acid fumes which diffuse
through tube are absorbed
by KO, fused.

Ditetryl gas (Tetrylene) 113
completely absorbed by fuming SO_3 acid

Aethyl same process Ed Burnett

Plat black absorbs Acetylene

When the vapor of any Volatile organic substance is submitted to the Electric Spark Acetylene is produced, ~~Gas~~ acetylene is formed in reaction above high temperature
Berthelot Ann chim+P (4) XXX
431

Thuster absorbed ○
by heating Electrically in
iron wire in Vac –
Thuster also used Metallic Sodium
1874 – in Vac tubes

Favre says denser Charcoal dont absorb so much gas as porous

MP v Wilder, Dent Chem Soc Rep Says Acetylene treated Electric spark Condensed to yellow oily liquid which after time turns brown no solvent can be obtained

Wood Charcoal placed in pyrex tube sealed at one end & heated to bo. light H2O other in freezing liquid

+ Saturated with dry Chlorine gives liquefied Chlorine Condensed Cont Volatile liquids like Bromine Hydrogen Sulphide Carbon Disulphide Dioxide Sulphur Ether + Alcohol retained with tenacity nothing Condensed

Phosphorous either in Vacuo or
H CO_2 Ar H or marsh gas or N
when exposed to Violet light. At
1st Volatilizes & then settles as side
glass in form Brown red Iodine
its ~~sublimed~~ that either O or Water
decomp does this but Gmelin
Said precautions taken

phosphoric Oxide absorbs
O & CP either dry or moist.
phos acid or Chloride show being
formed — When dry this Oxide
Yellow & distinctly tasted or
smell —

Phosphorus chemics from Oxidation
in highest Vac diminishes
as Vacuum fails — the quantity

the compression the less 119
it necessary to heat the P.
at atmospheric press temperature
must be 20 C

P. absorbs Chl nitrous ox
vapor hypontric acid, Marsh gas
olefiant gas or vapour Ether,
Rectified rock oil. Turpentine
Eupion, Creosote or Chlorohil
oil, because it forms a
Compound with them

Chlorine Combines with H to
from ~~Hydrated~~ Hydrochloric
acid which is ~~white~~ white - but
How about H_2O in Gaseous
what Coating with

Mercury absorbs the vapour of the Chlorine

Cl combines with H by electric Spark

Chl + CO, Combine in bright light in few minutes form phosgene gas ½ the Vol. its not decomp by the Elec spark when mixed with with either O or H but when mixed with ½ Vol O equal Vol H it Explodes yielding HCl + CO_2

Potassium Causes Entire disappearance of the gas

one portion absbg the Cl the other the O of the CO products
Chl K KO + Carbon
Phos sublime but produces no change in phosphorus gas -
Suboxide Lead absorbs O. made by heating glass tube — oil the tube containing Oxalate Lead. D+H has balls =

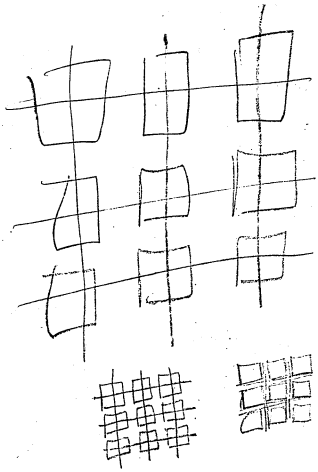
Acetylene is the only Hydrocarbon that can be prepared directly from its free Elements this occurring when the Electric arc passes between Carbon poles in an atmosphere of Hydrogen = It is formed from

nearly all organic Compounds at a red heat & occurs regularly in Coal gas it can be obtained from the latter in considerable quantities by incomplete Combustion

Its a Colorless gas — on passing Acetylene over heated Palladium H is set free + Volumes Colorless Compounds formed (1) CH_3CN (2) $CNaCNa$ which are violently decomposed by water.

If gaseous mixture acetylene passed over an ammoniacal Sol of Cuprous Chloride a red precipitate formed (Spongy ball moistened would answer) a strongly ammoniacal Sol of argentic Nitrate - white precip.

Acetylene is absorbed by Antimonic Chloride - precip.



Chlorine explodes when mixed with C2H2 acetylene

Acetylene is absorbed by Cold Bromine
it unites with Iodine at 100C forming Crystals which melted 70C

platinized asbestos produces slow Combustion by absorbing by mineral wool also —

Pumice stone & pipe clay are shown they absorb the produced (10) CO_2

All seem to agree that CO is readily absorbed by Cuprous Chloride in HCl.

(X) CO & H admixtures by spark after a long time gave an oily liquid which soon became amber color & on heating to 105C became Brown & was

slightly soluble in H_2O giving yellow opalescent Sol having odor of Mesityl oxide mixed with formic acid it reduced mercuric oxide. (How about putting a reducing agent on walls of globe of lamp)

Cyanogen & H with Electric spark combine to form Hydrocyanic acid

Graham says CO properly absorbed by xSol of Subchl Cu in HCl or Ammonia, indeed by ammoniacal Sols of Cuprous Salts in general the Sulphite x it absorbs it as quickly as Pelouze does CO_2

deposit on glass may be paracyanogen - its black

CO_2 is decomposed to free O + CO. by electric spark

Nitric Acid acts on Wood charcoal to form a soluble N_2O black stuff —

Hydrogen & Nitrogen are very slightly absorbed by Cocoanut Charcoal

Hunter = power to absorb ammonia with heat

Chromic anhydride combines with 135
acetylene -
Work back to 9 means coat bulb
with it =
CO may be oxidized to CO_2
by Chromic acid introduce
ball, plastic gas soaked
dil Chromic acid
Concentrate highly - try
drying thoroughly also higher
temp increases effect

Anhydrous Chromic A combines
directly with C according
to Berthelot (last Abstract)
in Vac —
H is oxidized by Chromic Acid
using plastic ball
dry Carbon might answer

here is table of ball with Chromic a in it

original Val	35·8
15 hours	29
19	27
26	23
65	7
86	00

When the Chromic a is detected Oxidn very slow

Ludwig recond balls of plaster Paris when absorptn agents are not fusible shaping with H_2O & moulding in bullet mould made of which is oiled, The reason they coat with syrupy Phos Acid is to put a stop to gas mechanically (we want the

Carbon monox uses ball
gypsum steeped moist
1 Vol saturated Chromic
a Sal & 2 Vols H_2O
the CO_2 must be absorbed by
Potash - The mixed
must be oiled as Chromic a
attacks it

---

1 Vol Coconut Charcoal will
absorb 4 of A & 15 of H
= Hundin

Dry Acetylene absorbed with
Evolution heat by
antimony pentachloride =

Acetylene is formed by silent
Electric spark among
hydrocarbons

Acetylene Colorless gas
Combines with Cl explosively in
diffused daylight result
heavy oil =

Acetylene forms metallic derivatives
with fused potassium forms
black powder = perhaps K of
ash of bamboo wastes

Acetylene united with
Copper forms detonating
Compound Acetylene in
presence moisture rapidly
absorbs Metallic Copper

142

143

Acetylene is absorbed by Copper becomes coated with black substance, (probably low oxides of Cu) but does not blue before or dried and does not explode

Naphthalin absorbs acetylene

Best Solvent Glacial Acetic Acid & Absolute Alcohol.

Poorer Solvents Turpentine & Bisulphide Carbon.

Petroleum de Carbon —

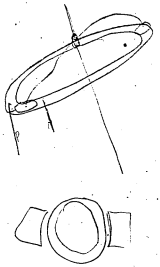
Berthelot states acetylene only formed by arc not by induction spark. (perhaps the loop high resistance stromeal) passage of Induction spark through CO gives acetylene

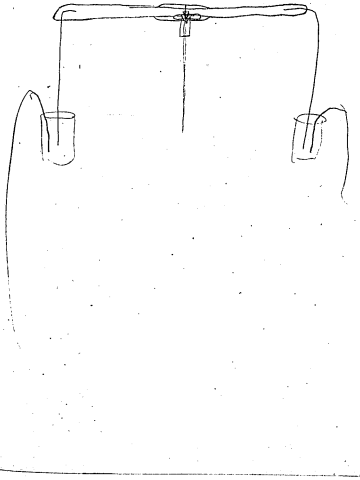
Cyanogen gas offers great resistance to spark

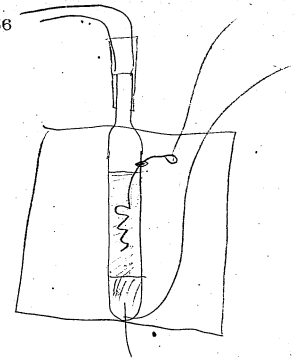
When Induction spark
passes through Marsh gas
Tarry black hydrocarbons are
deposited on tube.

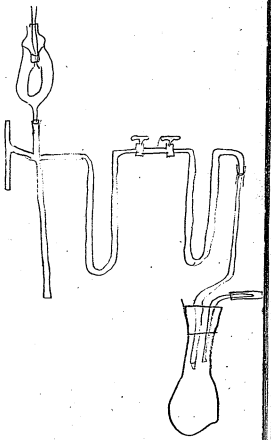
Acetylene is decomposed by
Electric spark & deposits
Charcoal Acetylene is
formed in all organic
Carbonizations.

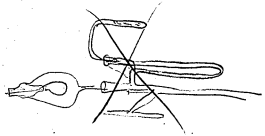
Send for metallic potassium
Sub-chloride Copper

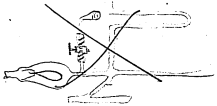












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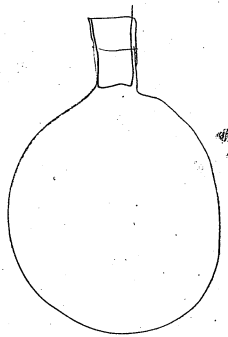

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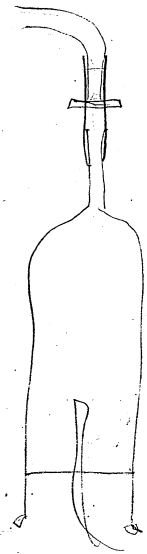

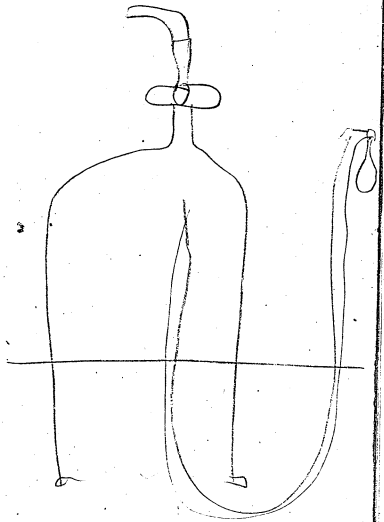

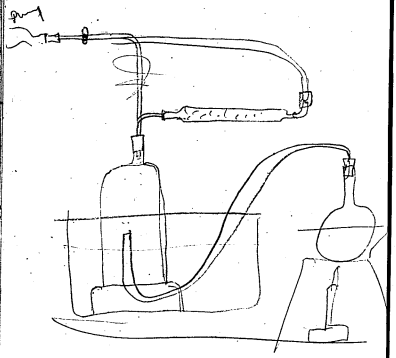

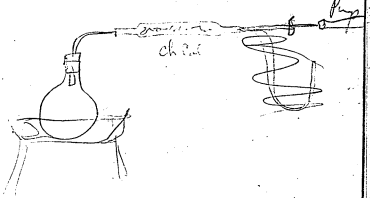

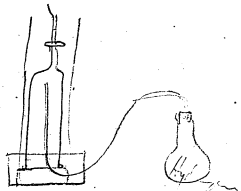

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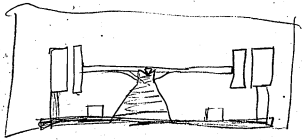

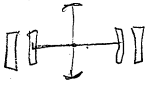

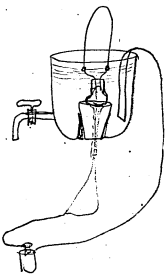

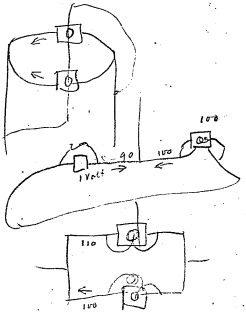
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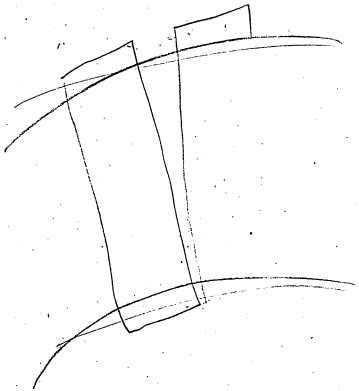

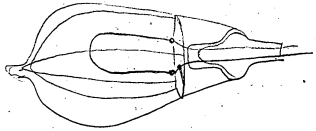

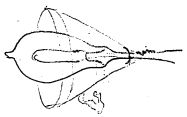

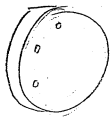

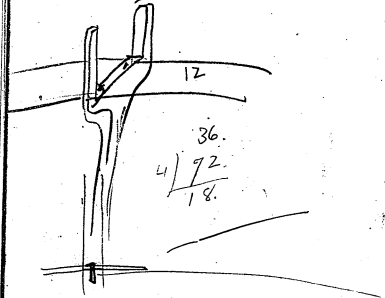
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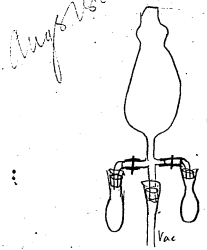
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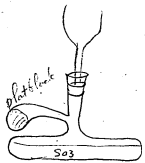
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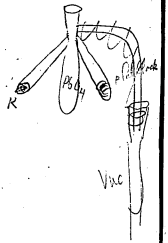
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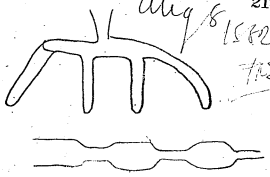
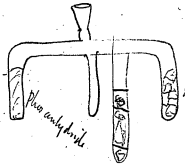
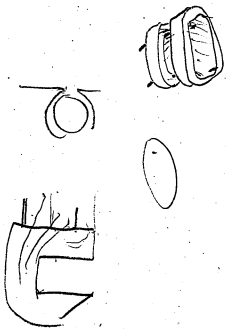
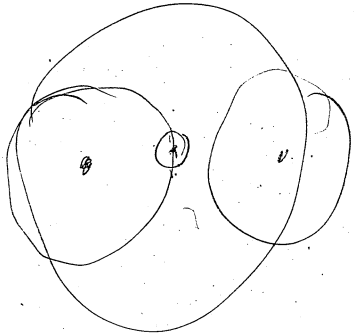
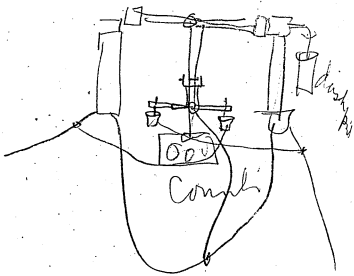
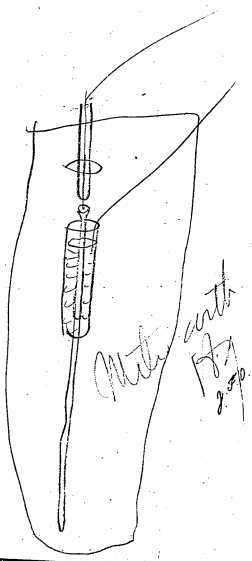


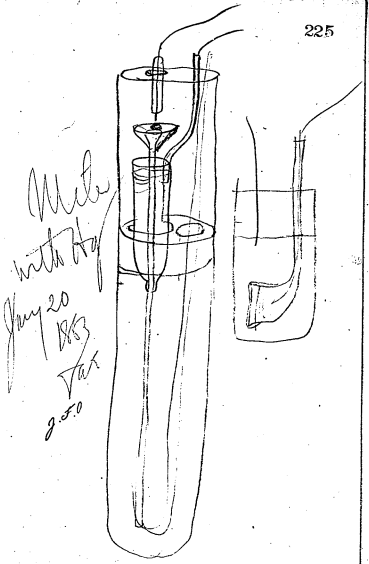


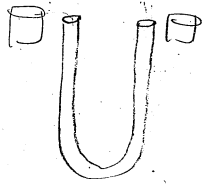


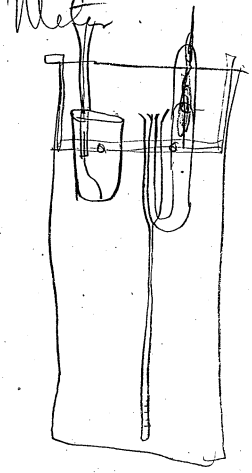


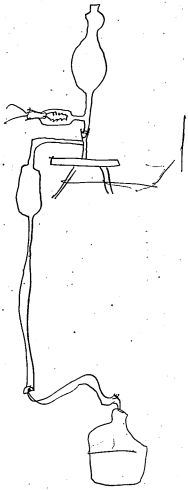


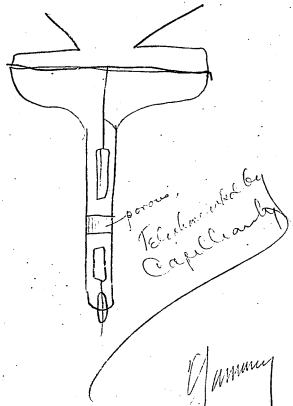


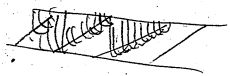









дорогой,
Сарелиан

276 absorbing HPP gas -
Gallo ox zinc
Bismuth

Melted balls Sul Soda melt.
Clear cam water Crystln.
Phosphoric anhydride must be used as drier.